

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

1. (currently amended) A method of managing resources of a service-oriented information system ~~relative to clients of the system, the method performed by a processor configured with memory included in the system,~~ the method comprising:

providing ~~access by the clients to a quality of service (QoS) management service of the system;~~ information services, quality of service (QoS) management services, and resource management services to a plurality of client applications through an information broker of the system;

receiving a quality of service (QoS) message from a client application ~~via the QoS management service~~ expressing at least one QoS requirement as at least one parameter value;

notifying the client that the at least one QoS requirement is denied;

negotiating a contract with the client via the QoS management service for quality of service based on the at least one parameter value; receiving a revised QoS message from the client and negotiating a contract with the client for quality of service based on the revised message; and

allocating at least one resource of the system to the client based on the contract; the receiving, notifying, and allocating steps performed through the information broker.

2. (original) The method of claim 1, wherein the client expresses the at least one QoS requirement in a plurality of categories of QoS characteristics.

3. (currently amended) The method of claim 1, further comprising, through the broker, governing interaction of the client with the system based on the contract.

4. (original) The method of claim 1, further comprising:
receiving a plurality of QoS messages from a plurality of the clients; and
allocating resources of the system based on a resource allocation policy.

5. (original) The method of claim 1, wherein allocating at least one resource comprises using a common management interface to implement at least one self-configurable resource.

6. (original) The method of claim 5, wherein implementing at least one self-configurable resource comprises implementing a resource as an object of a subclass of an abstract resource class.

7. (original) The method of claim 1, further comprising using the at least one parameter value to set at least one QoS value for the at least one resource.

8. (original) The method of claim 1, further comprising:
monitoring QoS parameters in the contract at runtime; and
adapting the allocation of resources and their parameters in response to a variance by the client from the contract.

9. (original) The method of claim 1, wherein establishing a contract comprises allowing the client to revise the parameter values to become consistent with a resource allocation policy of the system.

10. (original) The method of claim 1, wherein the information system includes a service-oriented architecture (SOA), said method performed as a service invoked by the client.

11. (original) The method of claim 1, further comprising:
receiving a plurality of QoS messages from a plurality of clients preparing to publish or subscribe a message or request a task execution; and

establishing contracts with the clients for quality of service based on their requirements expressed in the QoS messages.

12. (currently amended) A management apparatus for managing quality of service (QoS) in an information system, the management apparatus comprising:
~~a common service for providing quality of service (QoS) management in the information system, the common service accessible to a plurality of clients of the information system;~~

~~means for receiving, via the common service, at least one QoS requirement from at least one client of the information system;~~

~~means for using the at least one QoS requirement to negotiate via the common service at least one contract with the at least one client for quality of service; and~~

~~means for managing at least one resource of the system in accordance with the at least one contract.~~

a processor and memory; and

an information broker encoded in the memory and executable by the processor to provide information services, quality of service (QoS) management services, and resource management services to a plurality of client applications;

the broker executable by the processor to:

receive a quality of service (QoS) message from a client application expressing at least one QoS requirement as at least one parameter value;

notify the client that the at least one QoS requirement is denied;

receive a revised QoS message from the client and negotiate a contract with the client for quality of service based on the revised QoS message; and

manage at least one resource of the system in accordance with the contract.

13. (currently amended) The management apparatus of claim 12, further comprising means for expressing and querying the broker further executable by the processor to express and query a plurality of levels of QoS policies defined for network systems.

14. (currently amended) The management apparatus of claim 12, ~~wherein the managing means comprises means for allocating the broker further executable by the processor to allocate~~ at least one resource of the information system to a client based on at least one of a policy and the at least one contract.

15. (currently amended) The management apparatus of claim 12, ~~wherein the managing means comprises means for changing the broker further executable by the processor to change a QoS attribute of an allocated resource based on a variance from the at least one contract.~~

16. (currently amended) The management apparatus of claim 12, ~~wherein the managing means manages the broker further executable by the processor to manage~~ the at least one resource using a common management interface.

17. (currently amended) The management apparatus of claim 12, wherein the managing ~~[[means]]~~ is decoupled from a platform for which the at least one resource is implemented.

18. (original) The management apparatus of claim 12, wherein the information system comprises a service-oriented architecture (SOA), the management apparatus further configured as one of a plurality of services of the information system.

19. (currently amended) A ~~[[QoS]] quality of service (QoS)~~ management service for use in an enterprise system having a service oriented architecture (SOA), the QoS management service comprising a processor and memory of the enterprise system and a broker for a plurality of component services, the broker configured in the memory and executable by the processor to:

receive a QoS message from a service requester of the enterprise system expressing at least one QoS parameter;

negotiate with the service requester a QoS contract that includes the at least one QoS parameter;

notify the service requester that the at least one QoS parameter is unacceptable;

create a contract with the service requester for quality of service based on a revised QoS message received from the service requester;

monitor the QoS parameters in the contract; and

manage at least one resource of the enterprise system based on the monitoring.

20. (original) The QoS management service of claim 19, wherein the component services are further configured to adapt at least one resource of the enterprise system based on the monitoring.

21. (currently amended) The QoS management service of claim 19, wherein the component services are made available to the service requester by ~~a service provider of the enterprise system~~ the processor through the broker.

22. (original) The QoS management service of claim 19, wherein the component services are configured to manage a plurality of resources of the enterprise system based on a plurality of QoS contracts with a plurality of service requesters.

23. (original) The QoS management service of claim 22, wherein the plurality of service requesters comprise tasks and messages.

24. (original) The QoS management service of claim 19, wherein the component services are configured in a middleware layer of the enterprise system.

25. (currently amended) A tangible machine-readable medium for use with a processor having a memory, the machine-readable medium comprising:

instructions ~~to cause a~~ executable by the processor to provide a broker service commonly available to a plurality of client applications for quality of service (QoS) management in an information system;

~~instructions to cause a executable by the processor to receive, through the broker, a quality of service (QoS) message from a client application of the information system expressing at least one QoS requirement as at least one parameter value;~~

~~instructions to cause a executable by the processor to negotiate, through the broker, a contract with the client for quality of service based on the at least one parameter value, wherein the at least one parameter value is a revision of a parameter value previously denied by the broker; and~~

~~instructions to cause a executable by the processor to allocate, through the broker, at least one resource of the information system to the client based on the contract.~~

26. (currently amended) An apparatus comprising:

a computer-readable memory device having code embodied thereon to provide an information broker for an information system having a service-oriented architecture, the broker configured to, when executed by a processor of the information system, provide information services, quality of service (QoS) management services, and resource management services to a plurality of client applications;

the broker further configured to receive for receiving a quality of service (QoS) message from a client application of a service-oriented information system; and a processor configured to read the memory device and negotiate, via a QoS management service made available exported by the broker to clients of the information system the client application, a contract with the client application for quality of service based on at least one parameter value in the QoS message.

27. (currently amended) The apparatus of claim 26, wherein the ~~processor~~ broker is further configured to manage at least one resource of the information system based on the contract.

28. (currently amended) A QoS management service for use in an enterprise system having a service oriented architecture (SOA), the QoS management service comprising: a processor of the enterprise system, the processor having memory

configured with code executable by the processor to provide a broker through which information services, quality of service (QoS) management services, and resource management services are provided to a plurality of client applications; the broker configured to provide:

a QoS manager configured to receive a QoS message from a client application of the system expressing at least one QoS parameter;

an establishment service configured to establish with the client a QoS contract that includes the at least one parameter, ~~the establishment of the contract based on negotiation performed by~~ as revised from a previous QoS message from the client application, ~~the establishment service and the client through the QoS manager;~~ and

a resource manager configured to allocate at least one resource of the system based on the contract.

29. (original) The QoS management service of claim 28, further comprising a policy manager configured to:

check at least one policy of the system with regard to the at least one QoS parameter; and

determine at least one resource for satisfying a requirement of the client expressed in the at least one QoS parameter.

30. (original) The QoS management service of claim 28, further comprising an operation service configured to commit and initialize the at least one resource.

31. (original) The QoS management service of claim 28, further comprising a prediction service configured to:

track system conditions in terms of the at least one QoS parameter; and
predict a future system condition based on the tracked conditions.

32. (original) The QoS management service of claim 28, further comprising an adaptation service configured to change a resource based on the at least one QoS parameter.